(b) If $m=-1/2,\ -1/4,\ -3/4,\ \ldots,\ -\frac{[2p-1]_{p=1}^{p=q}}{2q}$, $(1+\frac{1}{m})^m$ is imaginary.

(c) If $m=-1/2$, $e<e+\sqrt{(-1)}<\infty$.

(d) If $m=-1$, $\infty<e-\infty<-e$.

Therefore the given statements are proved true unless $0>m\geqq-1$. For case (iv) no general statement of relative magnitudes can be made on account of discontinuous functions.

376. Proposed by W. W. BEMAN, Professor of Mathematics, University of Michigan, Ann Arbor, Michigan.

If $\frac{(1+1/m)^m}{e}=1-a_1\frac{1}{m}+a_2\frac{1}{m^2}-a_3\frac{1}{m^3}+\ldots$, prove $na_n=\sum_{k=1}^{k=n}\frac{k}{k+1}a_{n-k}$, and compute $a_1,\ a_2,\ a_3,\ \ldots,\ a_8$.

No solution of this problem has been received.

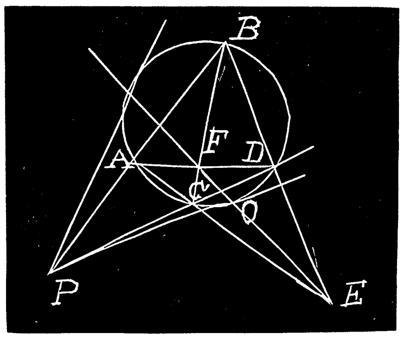
GEOMETRY.

400. Proposed by FRANCIS RUST, C. E., Pittsburgh, Pennsylvania.

Given a circle and a point P without; construct, *using the straight edge only*, the two tangents to the circle through P.

II. Solution by GEORGE W. HARTWELL, Hamline University, St. Paul, Minnesota.

Through P draw any two secants AB and CD, cutting the circle in A, B, C, and D. Join A and D, and A and C; B and D, and B and C. AC and BD meet at E, and AD and BC meet at F. Join E and F. EF is the polar of P. Then the points O and M in which the line EF intersects the circle are the points of tangency.



402. Proposed by H. PRIME, Boston, Mass.

The diameter of a hoop-shaped ring (or collar) is 24 inches at one edge and 28 inches at the other edge. A cross-section is a crescent with circular arcs of 120° and 60°, whose common chord is 4 inches long. Find its volume by elementary methods (without the use of calculus or the center of gravity).

Solution by H. E. TREFETHEN, Colby College.

Denote the given chord by AB, the axis of the ring by QQ, the arc of 120° by s, of 60′ by s'. Let ABC be an equilateral triangle. Complete the arcs s and s', and through A and C draw their diameters parallel to QQ.